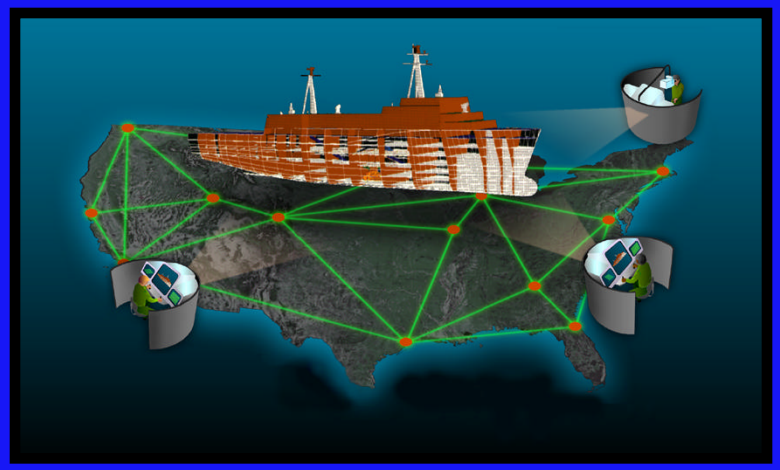
SBD OVERVIEW



VISION

ENABLE ACQUISITION REFORM BY PROVIDING GEOGRAPHICALLY DISTRIBUTED ENTERPRISES A SYNTHETIC ENVIRONMENT FOR PLANNING, DEVELOPING AND OPTIMIZING A PRODUCT THROUGH VIRTUAL PROTOTYPING

OBJECTIVES

- CHANGE THE ACQUISITION LIFE CYCLE
- ESTABLISH A PHYSICS-BASED SYNTHETIC ENVIRONMENT FOR DYNAMICALLY CONSTRUCTED SYSTEMS
- SUPPORT DISTRIBUTED COLLABORATIVE DESIGN
- PROVIDE MULTIDISCIPLINED OPTIMIZATION
- TRANSITION TO ACQUISITION PLANNERS, ENGINEERING DESIGN TEAMS, AND END-USERS

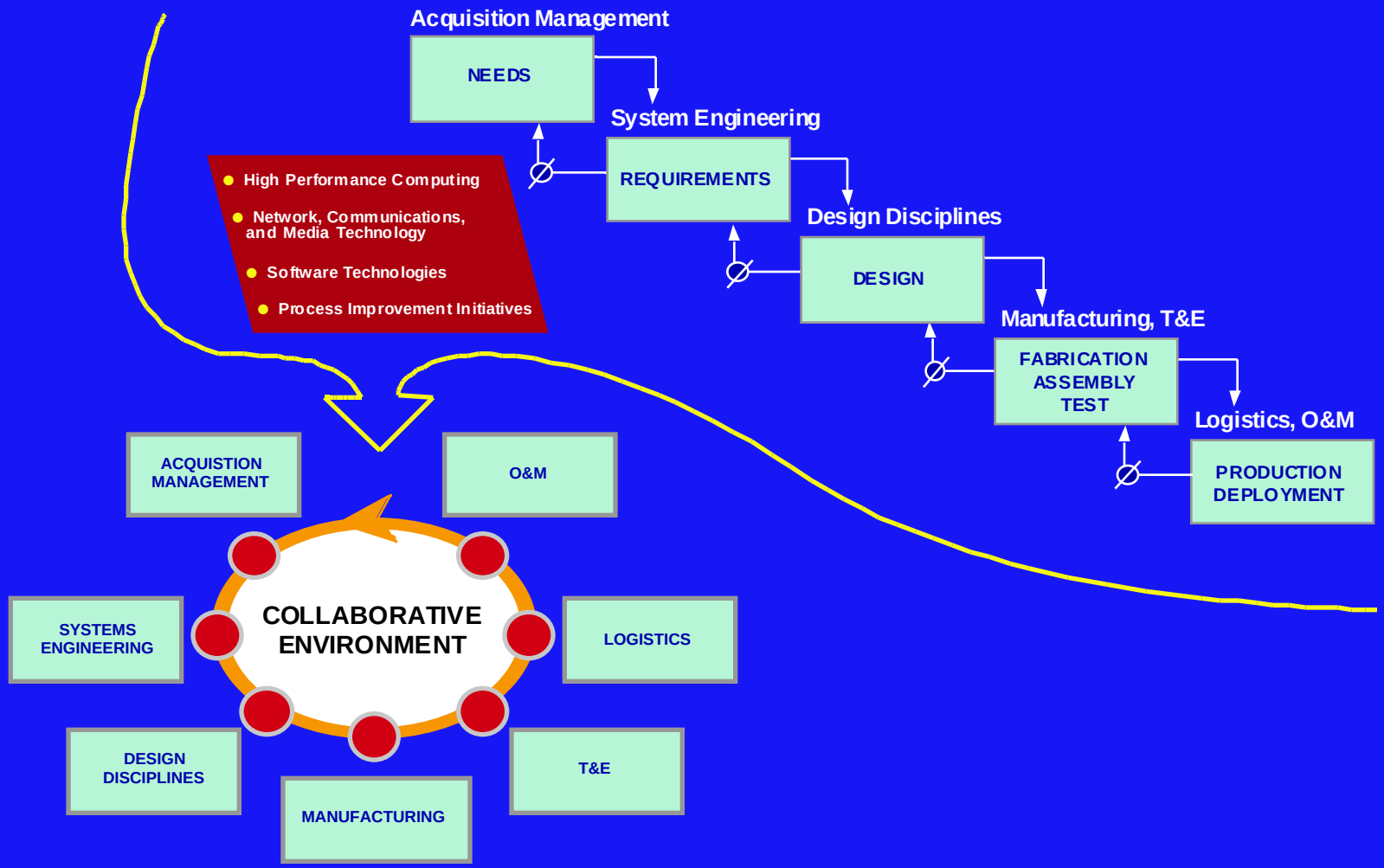
BENEFITS

- IMPROVED PRODUCT QUALITY AT LOWER COST
- INCREASED EFFICIENCY IN ENTERPRISE COLLABORATION
- THOROUGH PRODUCT DEFINITION PRIOR TO COMMITTING DESIGN
- REDUCED ACQUISITION RISK THROUGH BETTER PLANNING
- GREATER ACCURACY IN SCHEDULES DERIVED FROM THE TOTAL DETAILED ACQUISITION PROCESS

ACQUISITION PARADIGM CHANGE

Simulation Based Design

DARPA/TTO



ENABLES SBA

SBD ARCHITECTURE

Simulation Based Design

DARPA/TTO

CAD
- INTERGRAPH
- IDEAS
- PRO-E
- CATIA
- CV-CADDS

. . .

USER APPLICATIONS

DISCIPLINE SPECIFIC ANALYSIS
- STRUCTURAL DYNAMICS
- HYDRODYNAMICS
- SPACE ENVIRONMENT
- THERMAL
- SURVIVABILITY

. . .

SBD COLLABORATIVE INFRASTRUCTURE

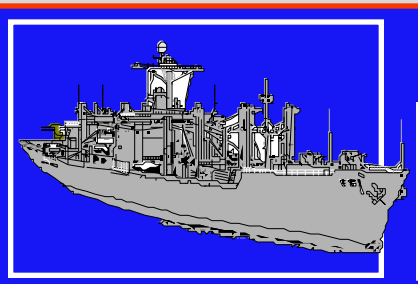
SBD SERVICES
- FEDERATION MANAGER
- RUN TIME INFRASTRUCTURE
- 3D VISUALIZATION AND INTERACTION
- MULTI-DISCIPLINARY OPTIMIZATION
- WRAPPER TOOL KIT
- GUIs AND BROWSERS
- MEGA PROGRAMMING

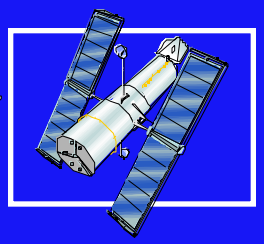
SPM SCHEMA (MODEL, CATALOGS)

MODEL CLASSES
- SYS
  - COMP.
- SHIP
  - HM&E
  - CIC
  - ECS
  - PROP.
  - . . .
- SPACECRAFT
  - STRUCTURE AND MECHANISMS
  - ELECTRICAL POWER
  - DATA PROCESSING
  - PROP.
  - . . .

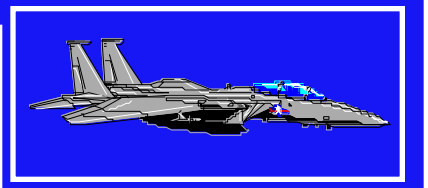
SBD STANDARDS
- CORBA
- HLA
- VRML
- HTML

. . .





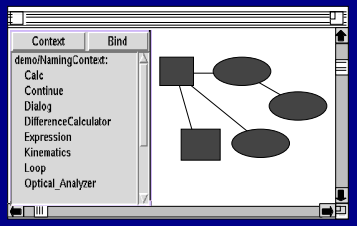
USER GUIs



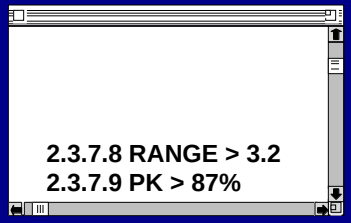
GLUE FOR COLLABORATIVE ENTERPRISE

ESVP CONCEPT OF OPERATIONS

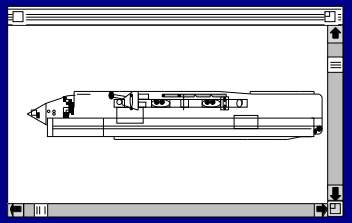
ARCHITECTURE DEFINITION



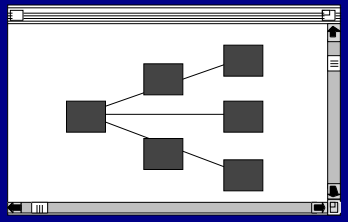
REQUIREMENTS PROTOTYPING



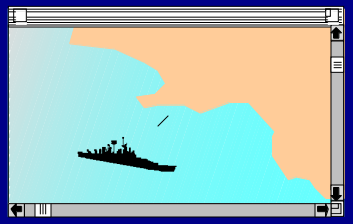
PHYSICAL LAYOUT



ANALYSIS & OPTIMIZATION



FUNCTIONAL SIMULATION & VISUALIZATION



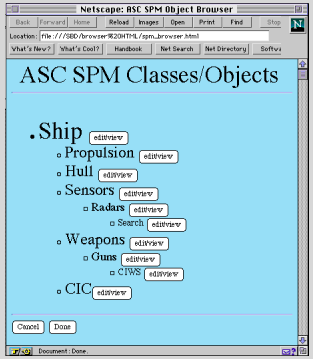
DEMONSTRATES HOW EXISTING DOMAIN SPECIFIC TOOLS CAN BE INTEGRATED INTO SBD AND OPERATE OFF THE SPM

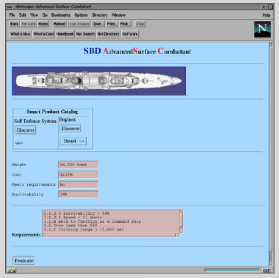
Simulation Based Design

ASC OBJECTIVES

DARPA/TTO

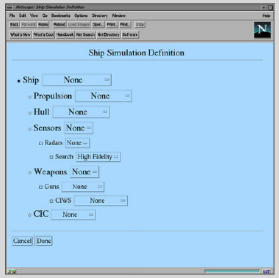
DESIGN BROWSING

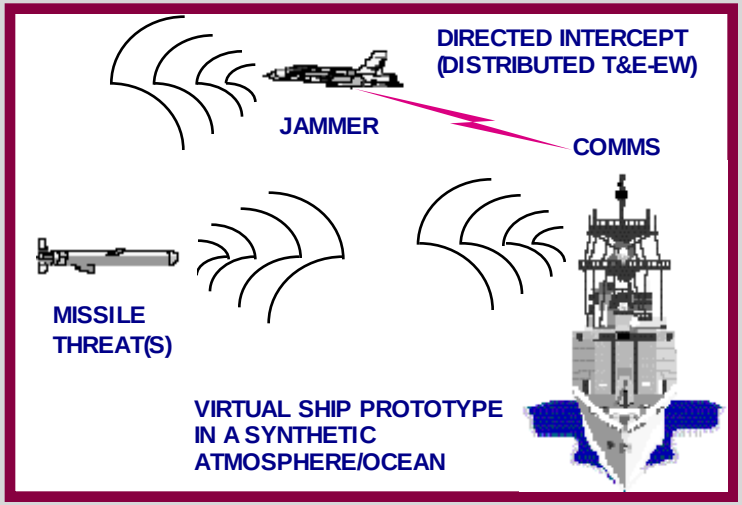




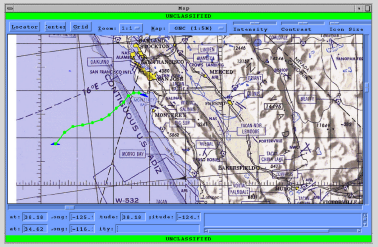
CATALOG COMPONENT SELECTION

SIMULATION DEFINITION

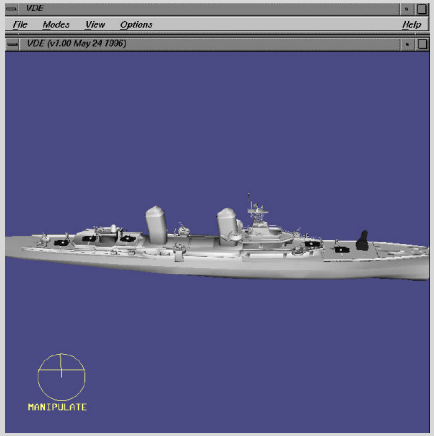




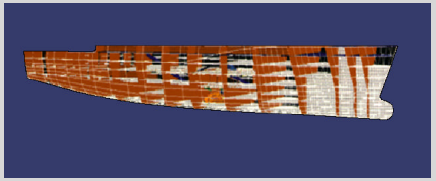
SCENARIO DEFINITION



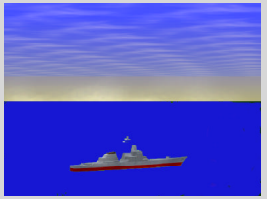
WEAPONS LAYOUT



HULL REDESIGN



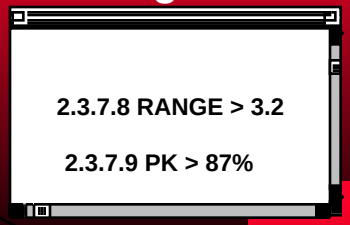
SIMULATION EXECUTION



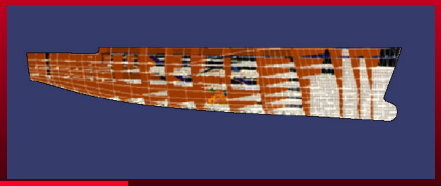
- **INTEGRATION AND COLLABORATION IN A VIRTUAL ENTERPRISE**
- **SEAMLESS INTEGRATION OF DATA AND TOOLS**
- **MULTIDISCIPLINARY ANALYSIS AND EVALUATION OF COMPLEX SYSTEMS**

ASC FEDERATION

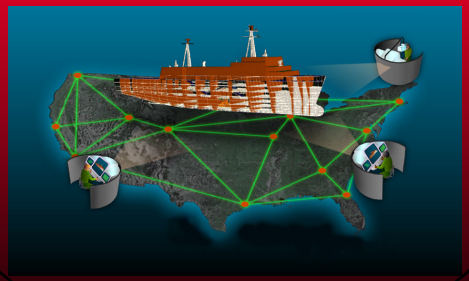
Program Management



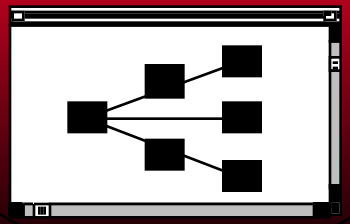
Ship Design



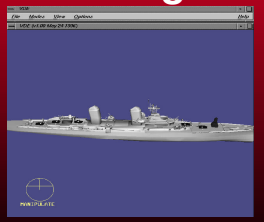
ASC Federation



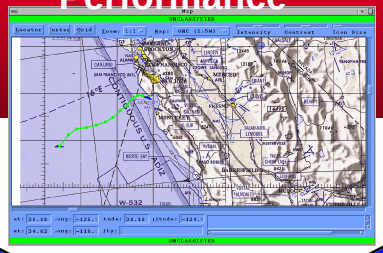
Engineering Analysis



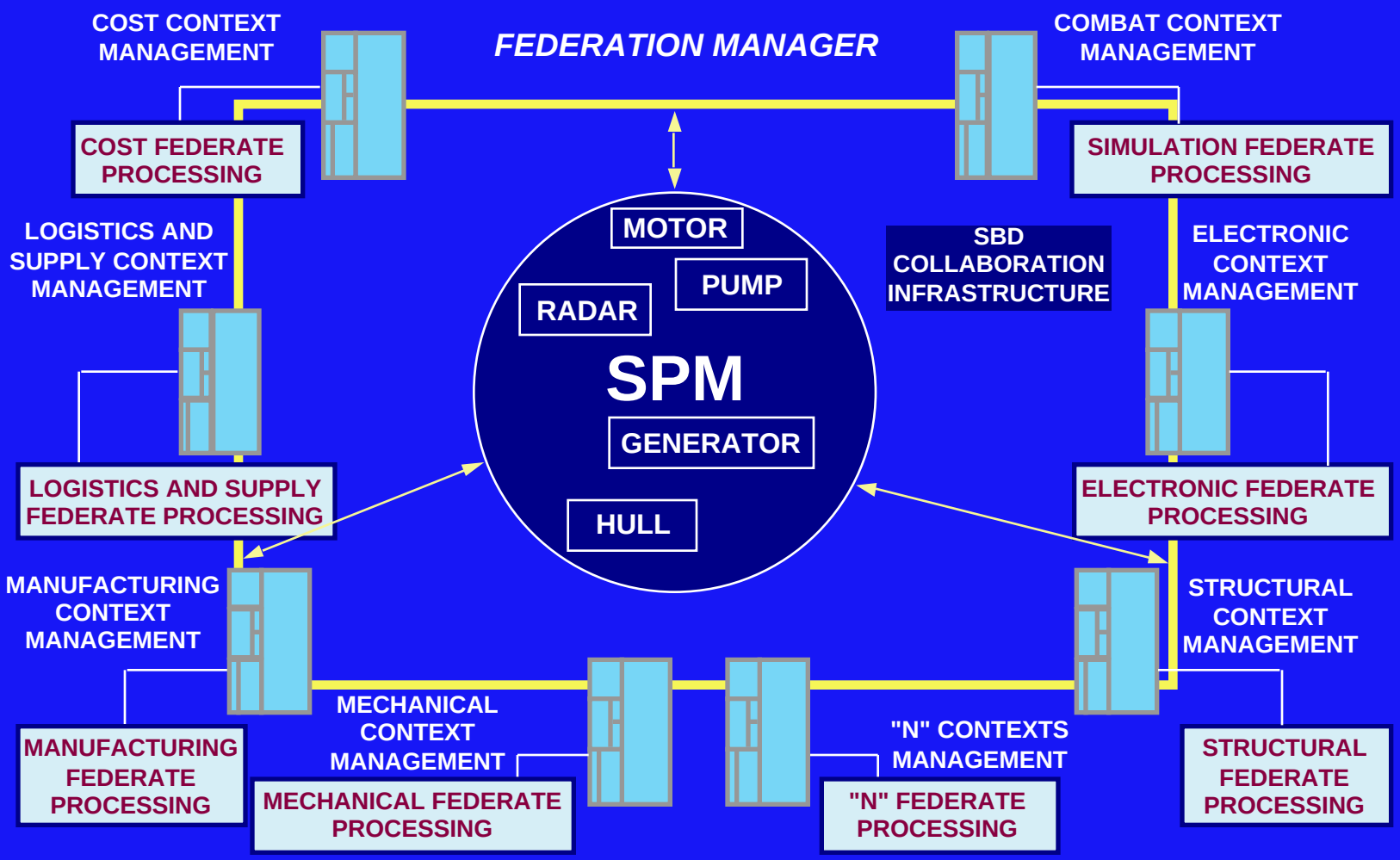
Combat System Design



Operational Performance



SBD ARCHITECTURE OVERVIEW



SBD SOFTWARE

SBD CORE

FEDERATION MANAGER

PHYSICAL DESIGN MANAGER

EXPERIMENT MANAGER

SPMFOM (COMBAT SYSTEM UPGRADE)

RTI

INTERFACE STANDARDS

CORBA

HLA

LEGACY TOOLS/DATA/PROCESSES

REQUIREMENTS MANAGER

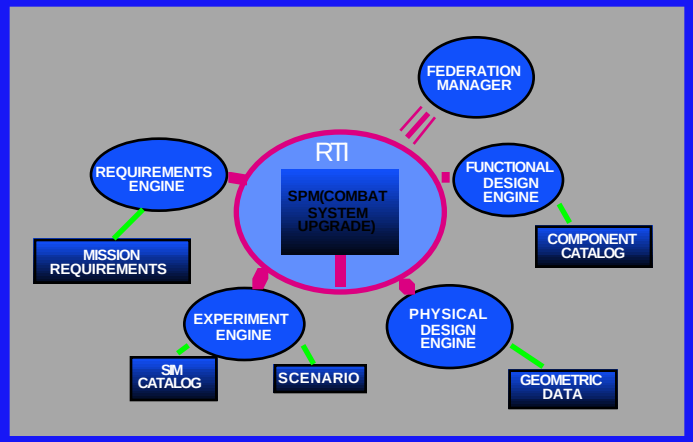
FUNCTIONAL DESIGN MANAGER

SCENARIO

COMPONENT CATALOG

SIM CATALOG

SBD FOR COMBAT SYSTEM DESIGN



USED TO CONFIGURE SBD SYSTEMS FOR SPECIFIC OBJECTIVES